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KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER

MACARTHUR, SYLVIA

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1763

DATE MAILED: 07/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/829,638

Applicant(s)

TOREK ET AL.

Examiner

Sylvia R. MacArthur

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) ____ is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-38 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-31 of U.S. Patent No. 6,758,938. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the present invention are broader than the claims of the patent. The claims of the present invention anticipate the claims of the patent, for example the present invention is held to an apparatus comprising at least one wafer-processing chamber wherein an ozone-rich environment exists within the wafer processing chamber with a rotator, sprayer, and a pulsating fluid source (see claim 1) while the patent claims an ozone source, the specific structure of the rotator, a sprayer and its specific location, and a pump. Claim 10 of the present invention corresponds to claim 13 of the patent, though the present invention is narrower (requiring that the fluid pulse more than once). Claim 17 of the present invention corresponds to claim 13 of the patent, though the present invention is narrower (requiring that the fluid introduce multiple pulses) and that the rotator is specifically a rotating platform. Claim 23 of the present invention

Art Unit: 1763

corresponds to claim 1 of the patent, though the present invention is narrower (requiring that the fluid pulse multiple times).

Claim Objections

3. Claim 9 is objected to because of the following informalities: claim 9 depends from claim

9. In this action application will assume applicant wishes claim 9 to depend on claim 1

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 4-6, 9-11, 17, 18, 23-25, 27, 29, 31, 32, 34, and 35-37 are rejected under 35

U.S.C. 103(a) as being unpatentable over Konishi et al (US 5,431,861) in view of Manos (US

5,672,212) and Dautartas et al (6,124,158).

Regarding claims 1, 4, 10, 17, 18, 23, 24, 25, 31, 35, 36 : Konishi et al teaches a wafer processing chamber wherein an ozone-rich environment (see col. 6 line 4) exists within the chamber. The apparatus comprises a rotator configured to rotate the wafer, a sprayer (nozzles 4, see col. 1 lines 54-60).

Konishi et al fails to teach a wafer cassette corresponding to the rotator.

Art Unit: 1763

Manos teaches a rotational cleaner/etcher for wafers. A rotational driving system 25 is used to rotate the wafer carrier 1 and the wafers 13 about the central axis while the wafers are in the tank 1. Col.3 lines 59-67 teaches a gap between the wafer and the carrier to expose processing solution to the maximum area of the wafer. The motivation to substitute the rotator of Manos is that this carrier provides ample support for the wafer without causing stresses to the wafer. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the apparatus of Konishi et al to include the rotator of Manos and a provision of cassette as wafer support.

The apparatus resulting from Konishi et al modified by Manos fails to teach a pulsating fluid source. Dautartas et al teaches a semiconductor apparatus wherein pulsed valves selectively pulse fluid through a sprayer see col.4 lines 24-27 and col.5 lines 14-20. The motivation to include the pulsed valves of Dautartas et al is that they provide enhanced flow control, increased efficiency and reliability. Thus, it would have been obvious at the time of the claimed invention to modify the apparatus of Konishi et al and Manos with the pulsed valves of Dautartas et al.

Regarding claims 2 and 37: Dautartas et al teaches that the substrate does not rotate as in stationary velocity.

Regarding claims 5, 27: Konishi et al illustrates a plurality of nozzles in Fig.2a.

Regarding claim 6: Dautartas et al discloses that the ozone pulses from 1 to 10 seconds see col. lines 5-15.

Art Unit: 1763

Regarding claims 9, 29, 34: Konishi et al illustrates that the wafer is located between the sprayer and the rotator, see Figs. 1 and 2

Regarding claims 11, 32: The rotator of Manos comprise at least one rod supports the wafer, see col. 3 lines 24-44.

6. Claims 3, 16, 19, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konishi et al in view of Manos and Dautartas et al as applied to claims 1, 2, 4-6, 9-11, 17, 18, 23-25, 27, 29, 31, 32, 34, and 35-37 above, and further in view of Erk et al US 5,593,505.

The teachings of Konishi et al, Manos, and Dautartas et al were discussed above.

Regarding 3 and 19: All fail to teach the velocity at which the rotator rotates.

Erk et al teaches a method for cleaning semiconductor wafer using a rotator. Claim 6 of Erk et al teaches that the wafer is rotated at 8 rpm, which is less than 100 rpm. In col. 6 lines 25-35, Erk et al teaches that the velocity at which the wafers are rotated allows for rapid cleaning which makes the process efficient. The velocity of rotation is a result effective variable commonly determined by routine experimentation. The process of conducting routine experimentation to produce such expected result obvious to one of ordinary skill in the art.

Thus it would have been obvious for one of ordinary skill to rotate the wafers at a velocity less than 100 rpm.

Art Unit: 1763

Regarding claims 16 and 28: Konishi et al, Manos, and Dautartas et al also fail to teach the temperature of the solution in the chamber. Erk et al teaches the bath (chamber) temperature is 60deg. C. The temperature of the chamber is a known optimizable parameter known to depend upon the type of solution and the desired process result. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to maintain an optimal temperature of the chamber that would result in the desired cleaning result.

7. Claims 14, 22, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konishi et al in view of Manos and Dautartas et al as applied to claims 1, 2, 4-6, 9-11, 17, 18, 23-25, 27, 29, 31, 32, 34, and 35-37 above, and further in view of Bergman et al (US 6,273,108).

The teachings of Konishi et al, Manos, and Dautartas et al were discussed above.

All fail to teach a pump as the means of fluid transport.


Bergman et al teaches an apparatus comprising a pump 55 connected to the fluid source (i.e. reservoir 45). The motivation to provide a pump is that pump are means of fluid transport with an art recognized capability of pulsing fluids. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide a pump in the apparatus of Konishi modified by Manos and Dautartas et al.

Art Unit: 1763

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438. The examiner can normally be reached on M-F during the core hours of 9 a.m. and 3 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Sylvia R MacArthur
Patent Examiner
Art Unit 1763

July 8, 2005